

CLAIMS

What is claimed is:

1. A thermoelectric cooler comprising:

a multistage thermoelectric cooler, each stage of said multistage cooler arranged with a Peltier device interposed between an intermediate heat sink and an intermediate cold sink, said Peltier device configured to exhibit a voltage drop.
2. The thermoelectric cooler of claim 1 whereby said multistage thermoelectric cooler effects heat transfer from a cold sink to a hot sink.
3. The thermoelectric cooler of claim 1 wherein said Peltier device is lead telluride.
4. The thermoelectric cooler of claim 1 wherein said Peltier device is bismuth telluride.
5. The thermoelectric cooler of claim 1 wherein said intermediate heat sink of stage n is an intermediate cold sink of stage n-1.
6. The thermoelectric cooler of claim 1 whereby electrons are transferred from said intermediate cold sink to said intermediate hot sink.
7. The thermoelectric cooler of claim 1 wherein said Peltier device is constructed of n-type semiconductor material.

8. The thermoelectric cooler of claim 1 wherein said Peltier device is constructed of p-type semiconductor material.
9. The thermoelectric cooler of claim 1 wherein said cooler is comprised of alternating n-type and p-type semiconductor material at each stage of said multistage thermoelectric cooler.
10. A thermoelectric cooler array comprised of the thermoelectric cooler of claim 1 arranged in an $M \times N$ array.
11. The thermoelectric cooler of claim 1 wherein each stage of said multistage thermoelectric cooler is manufactured by slicing a bonded n-type and p-type thermoelectric layer.
12. A method of manufacturing a multistage thermoelectric cooler, said method comprising the steps of:
 - creating an n-type thermoelectric substrate;
 - creating a p-type thermoelectric substrate;
 - selectively bonding said n-type thermoelectric substrate with said p-type thermoelectric substrate horizontally; and
 - slicing vertically said bonded substrate.
13. The method of claim 12, said method further comprising the step of:
 - stacking said vertically sliced bonded substrate; and

vertically slicing said stacked bonded substrate in an orthogonal direction to said first vertical slicing step.

14. The method of claim 12 wherein said n-type substrate is lead telluride.
15. The method of claim 12 wherein said p-type substrate is lead telluride.
16. The method of claim 12 wherein said n-type substrate is bismuth telluride.
17. The method of claim 12 wherein said p-type substrate is bismuth telluride.
18. The method of claim 12 wherein said steps are repeated for each specified layer of said multilayer thermoelectric cooler.